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# A Comparative Analysis of 20% Salicylic Acid Peel and 35% Glycolic Acid in Melasma

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**ABSTRACT**

In the present study, 50 patients of melasma attending outpatient department (OPD) of Dermatology Venereology and Leprology. Patients were diagnosed clinically and by wood's lamp and hand lens examination, and were randomly divided into two treatment groups, group-A: Patients on Glycolic acid and group-B: Patients on Salicylic acid. Majority of the patients 24 patients (48%) were in the age group of 40-50 years, with female predominance 42 patients (84%), with F: M ratio 4:1.In the present study, the duration of disease was found to be 1-2 years in 26 patients (52%). The average duration of disease was 2.78 years. Cosmetic use was seen as an exacerbating factor in 8 patients (16%).In the present study, centrofacial type was seen in 47 patients (94%), followed by malar type in 2 patients (4%) and mandibular type in only 1 patient (2%). In the present study, epidermal type was seen in 31 patients (62%) followed by mixed type in 17 patients (34%) and dermal type in only 2 patients (4%).The mean modified MASI scores in Glycolic acid were 6.10 (Day 1), 5.72 (2 weeks), 5.29 (4 weeks), 4.86 (6 weeks), 4.42 (8 weeks), 4.03 (16 weeks).The percentage change of the final score from that of baseline (Day1) of Glycolic acid was 33.89%.The mean modified MASI scores in Salicylic acid were 6.70 (Day 1), 6.34 (2 weeks), 5.84 (4 weeks), 5.42 (6 weeks), 5.07 (8 weeks), 4.84 (16 weeks).The percentage change of the final score from that of baseline (Day 1) of Salicylic acid was 27.72%. After completion of 16 weeks, the response in each group was graded. Glycolic acid showed very good response in 2 patients (8%), good response in 4 patients (16%), moderate response in 10 patients (40%), mild response in 8 patients (32%).Salicylic acid showed good response in 2 patients (8%), moderate response in 9 patients (36%), mild response in 12 patients (48%). No patient showed very good response. Over all very good response seen in 2 patients (4%), good response in 6 patients (12%), moderate response in 19 patients (38%), mild response in 20 patients (40%). In the present study, 3 patients discontinued 1 patient from the Glycolic acid group., she was a student not getting regular leaves. 2 patients were housewives having unrealistic expectations. The adverse effects during treatment were burning, erythema and post- inflammatory hyper pigmentation, which were tolerable. So the chemical peels (Glycolic acid and Salicylic acid) can be safely used in the treatment of melasma with minimal side effects.

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**Key Words**

Melasma, glycolic acid, epidermal type, glycolic acid and salicylic acid

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## INTRODUCTION

Melasma is a commonly acquired circumscribed hyper pigmentary disorder mainly involving sun-exposed areas, especially the face with a predilection for the cheeks, forehead, upper lip, nose and chin manifests as symmetrical, hyper pigmented macules with irregular, serrated, geographic spreading borders. The significance of this condition is due to the fact that it frequently relapses, difficult to treat and it severely affects social and emotional well-being of the patients. Melasma is more common in females accounting for 90% of all cases[1]. Sarkar *et al.* have reported a prevalence of 20.5% among Indian males[2]. The three patterns of pigmentation in melasma are centrofacial, malar and mandibular. In India, the malar region is involved most frequently, 73%[3]. It is more common in Fitz Patrick's skin types IV-VI, especially in women, namely the Hispanic, Caribbean and Asian races, who live in areas exposed to intense UV radiation resulting in larger amounts of melanin production[4]. In India, melasma is the most common pigmentary disorder, with an incidence of approximately 10%[5]. Prevalence of melasma varies between 1.5-33.3% depending on the population. Prevalence in pregnancy 50-70%, males 20.5-25.83%[4,5]. Melasma has strong correlation with positive family history., thus genetic factors have a role in the development of melasma[6]. Chemical peeling is the application of chemical agents to the skin, which causes a controlled destruction of a part or entire epidermis, with or with out dermis, leading to exfoliation, removal of superficial lesions, followed by regeneration of new epidermal and dermal tissues. The objective of chemical peeling is to cause destruction at the required depth, followed by remodeling without scarring[7-12]. Chemical peeling is a common procedure that has evolved over the years, using th e scientific knowledge of wound healing after controlled chemical skin injury. The concept of peeling the skin is to improve texture, color, smoothen and beautify skin since ancient times. In spite of the advent of newer techniques and lasers, peeling has stood as a simple procedure, requiring hardly any instrumentation to rejuvenate the skin.

## MATERIALS AND METHODS

**Source of Data:** Patients attending OPD of various age groups and either sex presenting with complaints of melasma to Department of Dermatology Venereology and Leprosy. It is a prospective comparative study between 35% Glycolic acid and 20% Salicylic acid. 50 patients were consecutively selected and allocated into 2 groups. Each group will have a minimum of 25 patients.

- **Group A:** 35% Glycolic acid (25 patients).
- **Group B:** 20% Salicylic acid (25 patients).

**Methods for Collection of Data**: Patients adopting the following criteria are included.

**Inclusion Criteria:**

- Patients of either sex having melasma.
- Patients who are willing for follow up.

**Exclusion Criteria:**

- HIV I and II patients.
- HBs Ag positive patients.
- Pregnancy and Lactation.
- Patients with systemic illness like uncontrolled hypertension, diabetes, malignancy and mental disorders.
- Patients on immunosuppressive therapy.
- History of taking photosensitive drugs and oral contraceptives.
- Active infections (bacterial, viral, fungal).
- Patients with unrealistic expectations.

Patients fulfilling the above criteria were asked for written consent for their participation in the study. Details of the patient name, age, marital status, occupation, duration of the disease, onset of disease, family history, history of sun exposure, history of cosmetic use, drug history, history of any systemic illness, menstrual history ( In females) were recorded. After a detailed history, clinical examination done under natural light, hand lens and wood's light examination, MASI score (modified MASI) melasma area and severity index should be calculated and photographs were taken. Patients were divided into two groups. Each group contains 25 patients by simple random method.

**Chemical Peeling Procedure was Divided Into Three Steps:**

- **Pre Peel:** Priming 2 weeks before application of peeling agent, skin preparation before applying peeling agent.
- **Application of peeling agent.**
- **Post peel care.**

**Pre Peel:**

- **Priming:** 2 weeks before the procedure, patients were subjected to priming daily with sun screen in the morning and depigmenting agents (kojic acid) at night.
- **Skin preparation before applying peeling agent:**
- Patient was advised to wash the face with soap and water.
- The Patient advised to lie down with head elevated to 45 degrees, with eyes closed.
- Patient's hair is pulled back with a hairband or cap.
- Using gauze pieces, patient's skin was cleaned with alcohol and degreased with acetone.

**Application of Peeling Agent:**

- The required strength of the peeling agent was poured into a bowl and neutralizing agents were kept ready.
- Sensitive areas like inner and outer canthus of the eyes and nasolabial folds were protected with petrolatum jelly (Vaseline).
- The peeling agent was applied either with a brush, cotton applicator or gauze.
- The chemical agent is applied quickly on the entire face, beginning from the forehead, then the right cheek, nose, left cheek and chin in order.
- Periorbital area, upper and lower eyelids were treated last.
- Feathering strokes were applied at the edges to blend with the surrounding skin and to prevent the demarcation lines.
- For GA peels, 35% strength was used for all patients., the peel was neutralized after the predetermined duration of time 2-5 minutes. The neutralization was done with 10-15% sodium bicarbonate and then washed off with water.
- For salicylic acid peels, 20% strength was used for all patients., it crystallized, forming a pseudo-frost. 1-3 coats were applied to get an even frost.
- After 3-5 minutes.
- Patient skin was gently dried with gauze.
- Patient was asked to wash face with water until burning sensation subsided.

**Post Peel Care:**

- The patients were asked to use mild cleanser or soap.
- Patients were advised to use sun screens and moisturizers daily.
- Patients were advised to avoid peeling and scratching of the skin.
- Patients were advised to avoid chlorinated water for three days after the procedure.
- If there is crusting, patients were advised to use a topical antibiotic ointment.

The procedure was done when patient came to OPD on the first day( Baseline modified MASI), And thereafter once in every 2 weeks up to 8 weeks( 2 months) and last sitting at 16 weeks (4 months). After each sitting, the degree of improvement in pigmentation was assessed by re-measuring modified MASI and post-peel photographs. Side effects were recorded. After the last sitting percentage of improvement and response was recorded. To calculate modified MASI, the face was divided into four regions, forehead (F) 30%, right malar (RM) 30%, Left malar (LM) 30%, and chin (C) 10%. After the completion of the study, the data obtained were analyzed statistically by using IBM SPSS Version 24.0 software (student's T-test, Chi-square test and significant figures). The response in each patient was graded at the end of the last follow up based on percentile reduction in modified MASI as: a) No response-no change in modified MASI score, b) Mild response <25%, c) Moderate response-25-50%, d) Good response-50-75%, e) Very good response -> 75% fall in modified MASI score.

## RESULTS AND DISCUSSION

This is a prospective comparative study between 35% Glycolic acid peel and 20% Salicylic acid peel. Patients who are attending to Dermatology Venereology and Leprosy (DVL). In the present study, most of the patients, 24 patients (48%) were in the age group of 40-50 years (Glycolic acid 12 patients, Salicylic acid 12 patients), then 14 patients (28%) were in the age group of 30-40 years (Glycolic acid 7 patients, Salicylic acid 7 patients), 8 patients (16%) were in the age group of 50 and above 50 years (Glycolic acid 4 patients, Salicylic acid 4 patients), 4 patients (8%) were in the age group between 20-30 years (Glycolic acid 2 patients, Salicylic acid 2 patients). The youngest patient with melasma in the present study was 23 years old and the eldest was 68 years old. In the present study, the most common age distribution was, the age group between 40-50 years constitutes 48%. The average age of patients with melasma in the present study was 41.7 years. In the present study, melasma was predominant in females. The female patients were 42 (84%), (Glycolic acid 20 patients, Salicylic acid 22 patients). The male patients were 8 (16%), (Glycolic acid 5 patients, Salicylic acid 3 patients). The female to male ratio was 4:1. In the present study, the duration of disease was found to be more in 1-2years in 26 patients (52%), (Glycolic acid 13 patients, Salicylic acid 13 patients), followed by 3-5 years duration in 21 patients (42%), (Glycolic acid 10 patients, Salicylic acid 11 patients) and 6-8 years duration in 3 patients (6%), (Glycolic acid 2 patients, Salicylic acid 1 patient). The mean duration of the disease was 2.78 years. In the present study, positive family history was present in 16 patients (32%), (Glycolic acid 7 patients, Salicylic acid 9 patients), and no family history in 34 patients (68%), (Glycolic acid 18 patients, Salicylic acid 16 patients). In the present study, history of sun exposure present in, 16 patients (32%), (Glycolic acid 9 patients, Salicylic acid 7 patients) and, no history of sun exposure in 34 patients (68%), (Glycolic acid 16 patients, Salicylic acid 18 patients). In the present study, cosmetic use was a precipitating g factor in 8 patients (16%), (Glycolic acid 6 patients, Salicylic acid 2 patients), patients not used any cosmetics 42 (84%), ( Glycolic acid 19 patients, Salicylic acid 23 patients). In the present study, centrofacial type was seen in maximum number of patients, 47 patients (94%), (Glycolic acid 24 patients, Salicylic acid

**Table 1: Histological Types by Wood's Lamp* Group**

| Group | | | | | |
|---|---|---|---|---|---|
| **Glycolic Acid** | | | | **Salicylic Acid** | **Total** |
| Der_Epiderm_Mixed | Dermal | Count | 2 | 0 | 2 |
| | | % within Group | 8.0% | 0.0% | 4.0% |
| | Epidermal | Count | 17 | 14 | 31 |
| | | % within Group | 68.0% | 56.0% | 62.0% |
| | Mixed | Count | 6 | 11 | 17 |
| | | % within Group | 24.0% | 44.0% | 34.0% |
| Total | | Count | 25 | 25 | 50 |
| | | % within Group | 100.0% | 100.0% | 100.0% |

**Table 2: T-Test Analysis**

| N | | | Mean | Std. Deviation | Std. Error | 95% Confidence Interval for Mean | | Minim um | Maximum |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Lower Bound | Upper Bound | | |
| Age | Glycolic Acid | 25 | 41.72 | 9.099 | 1.820 | 37.96 | 45.48 | 23 | 68 |
| | Salicylic Acid | 25 | 41.80 | 8.236 | 1.647 | 38.40 | 45.20 | 26 | 60 |
| | Total | 50 | 41.76 | 8.589 | 1.215 | 39.32 | 44.20 | 23 | 68 |
| Disease_Dur ation | Glycolic Acid | 25 | 2.80 | 1.871 | .374 | 2.03 | 3.57 | 1 | 8 |
| | Salicylic Acid | 25 | 2.76 | 1.128 | .226 | 2.29 | 3.23 | 1 | 6 |
| | Total | 50 | 2.78 | 1.529 | .216 | 2.35 | 3.21 | 1 | 8 |
| Baseline Modified | | | | | | | | | |
| _MASI_D1 | Glycolic Acid | 25 | 6.096 | 2.8515 | .5703 | 4.919 | 7.273 | 2.6 | 13.9 |
| | Salicylic Acid | 25 | 6.696 | 3.4326 | .6865 | 5.279 | 8.113 | 2.1 | 17.2 |
| | Total | 50 | 6.396 | 3.1378 | .4437 | 5.504 | 7.288 | 2.1 | 17.2 |
| Modified MASI | | | | | | | | | |
| _2weeks | Glycolic Acid | 25 | 5.720 | 2.7936 | .5587 | 4.567 | 6.873 | 2.3 | 13.6 |
| | Salicylic Acid | 25 | 6.344 | 3.3724 | .6745 | 4.952 | 7.736 | 1.9 | 16.5 |
| | Total | 50 | 6.032 | 3.0810 | .4357 | 5.156 | 6.908 | 1.9 | 16.5 |
| Modified MASI | | | | | | | | | |
| _4weeks | Glycolic Acid | 24 | 5.287 | 2.7749 | .5664 | 4.116 | 6.459 | 2.0 | 13.2 |
| | Salicylic Acid | 23 | 5.843 | 3.1389 | .6545 | 4.486 | 7.201 | 1.6 | 16.0 |
| | Total | 47 | 5.560 | 2.9396 | .4288 | 4.696 | 6.423 | 1.6 | 16.0 |
| Modified MASI | | | | | | | | | |
| _6weeks | Glycolic Acid | 24 | 4.858 | 2.8034 | .5722 | 3.675 | 6.042 | 1.5 | 13.0 |
| | Salicylic Acid | 23 | 5.417 | 3.0361 | .6331 | 4.104 | 6.730 | 1.3 | 15.7 |
| | Total | 47 | 5.132 | 2.9014 | .4232 | 4.280 | 5.984 | 1.3 | 15.7 |
| Modified MASI | | | | | | | | | |
| _8weeks | Glycolic Acid | 24 | 4.421 | 2.8529 | .5823 | 3.216 | 5.626 | 1.0 | 12.8 |
| | Salicylic Acid | 23 | 5.074 | 2.9298 | .6109 | 3.807 | 6.341 | 1.3 | 15.3 |
| | Total | 47 | 4.740 | 2.8782 | .4198 | 3.895 | 5.585 | 1.0 | 15.3 |
| Modified MASI | | | | | | | | | |
| _16weeks | Glycolic Acid | 24 | 4.025 | 2.6996 | .5511 | 2.885 | 5.165 | .7 | 11.1 |
| | Salicylic Acid | 23 | 4.843 | 3.0154 | .6288 | 3.540 | 6.147 | 1.1 | 15.7 |
| | Total | 47 | 4.426 | 2.8572 | .4168 | 3.587 | 5.264 | .7 | 15.7 |
| Improvement | Glycolic Acid | 24 | 36.1739 | 21.53168 | 4.3951 4 | 27.081 8 | 45.2659 | 5.00 | 85.11 |
| | Salicylic Acid | 23 | 27.5 4 11 | 14.94956 | 3.1172 0 | 21.076 4 | 34.0058 | 6.90 | 56.47 |
| | Total | 47 | 31.94 93 | 18.91350 | 2.7588 2 | 26.396 1 | 37.5025 | 5.00 | 85.11 |

23 patients), followed by malar type 2 patients (4%), (Glycolic acid no patients, Salicylic acid 2 patients) and mandibular 1 patient (2%), ( Glycolic acid 1 patient, Salicylic acid no patients). In the present study, the most common histological variant was epidermal seen in 31 patients (62%), (Glycolic acid 17 patients, Salicylic acid 14 patients), followed by mixed-type seen in 17 patients (34%), (Glycolic acid 6 patients, Salicylic acid 11 patients) and lastly dermal type seen in 2 patients (4%), (Glycolic acid 2 patients, Salicylic acid no patients). In the present study, modified MASI based on area and darkness of the patches was assessed. Follow up visits were done at the end of 2 weeks, 4 weeks, 6 weeks, 8 weeks and 16 weeks. Percentage of improvement with Glycolic acid at 16 weeks found to be 33.89% by modified MASI scoring. Percentage of improvement with Salicylic acid at 16 weeks found to be 27.72% by modified MASI scoring. The mean value of the total percentage of improvement for both Glycolic acid and Salicylic acid was found to be 31.94% by modified MASI scoring. In the present study, Moderate response seen with Glycolic acid in 40% of cases, mild response seen with Salicylic acid in 48% of cases and mild response seen with average of both Glycolic acid and Salicylic acid 40%. In the present study, adverse effects, overall burning, was the most common adverse effect seen in 88% of patients (Glycolic acid 92%, Salicylic acid 84%), erythema 76% (Glycolic acid 76%, Salicylic acid 76%). Pigmentation 12% (Glycolic acid 4%, Salicylic acid 20%), desquamation 4%, milia 4%.

## CONCLUSION

Centrofacial was the most common type, followed by malar and mandibular types. Sun exposure, genetic factors and cosmetic use appear either to precipitate or to cause the melasma. The most common histological variant was epidermal, followed by mixed and dermal type. Two different chemical peels, Glycolic acid and Salicylic acid, have been found to be effective in the management of melasma. Modified Melasma area severity index (MASI) was employed to compare

the efficacy of two peels. It is consistently shown that Glycolic acid produced better results than Salicylic acid peel.

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